

**RESPONSE TO FIRST OFFICE ACTION**

Serial Number: 10/585,373

Attorney Docket: IP-0338-US

§ 371(c) date: October 20, 2008

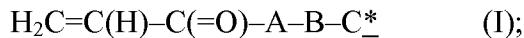
Title: Modified Molecular Arrays

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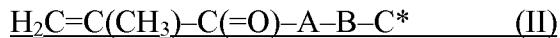
**Amendment to the Claims**

Please amend the claims as follows:

1. (currently amended) A method of preparing a hydrogel immobilised to a solid support that is not covalently surface-modified, comprising polymerising on said support a mixture of:
  - (i) a first comonomer which is acrylamide, methacrylamide, hydroxyethyl methacrylate or *N*-vinyl pyrrolidinone; and
  - (ii) a second comonomer which is a functionalised acrylamide or acrylate of formula (I) :



or a methacrylate or methacrylamide of formula (II):



(wherein:

A is NR or O, wherein R is hydrogen or an optionally substituted saturated hydrocarbyl group comprising 1 to 5 carbon atoms;

–B– is an optionally substituted alkylene biradical of formula  $-(\text{CH}_2)_n-$  wherein n is an integer from 1 to 50; and

wherein n = 2 or more, one or more optionally substituted ethylene biradicals – $\text{CH}_2\text{CH}_2-$  of said alkylene biradical may be independently replaced by ethenylene and ethynylene moieties; and

wherein n = 1 or more, one or more methylene biradicals  $-\text{CH}_2-$  may be replaced independently with an optionally substituted mono- or polycyclic hydrocarbon biradical comprising from 4 to 50 carbon atoms, or a corresponding heteromonocyclic or heteropolycyclic biradical

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wherein at least 1 CH<sub>2</sub> or CH<sub>2</sub> is substituted by an oxygen sulfur or nitrogen atom or an NH group; and

C\* is a group for reaction with a compound to bind said compound covalently to said hydrogel) to form a polymerised product,

characterised in that said method is conducted on, and immobilizes the polymerised product to, said support which is not covalently surface-modified.

2. (original) The method as claimed in claim 1 wherein said support is a silica-based support.
3. (original) The method as claimed in claim 2 wherein said silica-based support is fused silica.
4. (canceled)
5. (original) The method as claimed in claim 1 wherein said support is a non silica-based support.
6. (original) A method as claimed in claim 1 wherein said first comonomer is acrylamide.
7. (original) A method as claimed in claim 1 wherein said second comonomer is an acrylamide of formula (I).
8. (original) A method as claimed in claim 6 wherein said acrylamide of formula (I) has A=NH.
9. (original) A method as claimed in claim 1 wherein -B- is a C<sub>2</sub>-C<sub>10</sub> alkylene biradical.

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10. (original) The method as claimed in claim 8 wherein –B– is –(CH<sub>2</sub>)<sub>5</sub>–.
11. (currently amended) The method as claimed in claim 1 wherein C\* is hydroxyl, thiol, amine, acid, ester or haloacetamido.
12. (original) The method as claimed in claim 11 wherein said haloacetamido is bromoacetamido.
13. (original) The method as claimed in claim 1 wherein said acrylamide of formula (I) is N-(5-bromoacetamidopentyl) acrylamide (BRAPA).
14. (original) The method as claimed in claim 1 wherein said second comonomer is present in an amount of  $\geq 1$  mol % relative to the total molar quantity of comonomers.
15. (original) The method as claimed in claim 14 wherein said second comonomer is present in an amount of  $\geq 2$  mol % relative to the total molar quantity of total comonomers.
16. (original) The method as claimed in claim 1 wherein no polyunsaturated crosslinking agent is present during said polymerising.
- 17–36. (canceled)
37. (canceled)
38. (currently amended) The method of claim 43 37 wherein said molecules of interest are biomolecules.
39. (canceled)

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40. (currently amended) The method of claim 43 39 wherein the molecules of interest are attached directly or through a linking moiety to a silica-based support.

41. (currently amended) The method of claim 43 39 wherein the hydrogel is a polyacrylamide hydrogel.

42. (currently amended) The method of claim 43 39 wherein the polyelectrolyte multilayer comprises one or more layers of each of polyallylamine and polyacrylic acid wherein the surface to which the biomolecules are attached comprises polyacrylic acid.

43. (currently amended) The method of claim 39 A method of modifying a molecular array, which molecular array comprises a plurality of molecules of interest immobilised to a surface of a hydrogel support, said method comprising the step of applying to the array polyelectrolyte or neutral polymers, wherein the hydrogel is obtainable by a method comprising polymerising on a solid support that is not covalently surface-modified, a mixture of:

- (i) a first comonomer which is acrylamide, methacrylamide, hydroxyethyl methacrylate or *N*-vinyl pyrrolidinone; and
- (ii) a second comonomer which is a functionalised acrylamide or acrylate of formula (I):

$$\text{H}_2\text{C}=\text{C}(\text{H})-\text{C}(=\text{O})-\text{A}-\text{B}-\text{C}_* \quad (\text{I});$$

or a methacrylate or methacrylamide of formula (II):

$$\text{H}_2\text{C}=\text{C}(\text{CH}_3)-\text{C}(=\text{O})-\text{A}-\text{B}-\text{C}^* \quad (\text{II})$$

or  ~~$\text{H}_2\text{C}=\text{C}(\text{CH}_2)-\text{C}(=\text{O})-\text{A}-\text{B}-\text{C}$~~  (III)

(wherein:

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A is NR or O, wherein R is hydrogen or an optionally substituted saturated hydrocarbyl group comprising 1 to 5 carbon atoms;

-B- is an optionally substituted alkylene biradical of formula  $-(\text{CH}_2)_n-$  wherein  
 $n$  is an integer from 1 to 50; and  
wherein  $n = 2$  or more, one or more optionally substituted ethylene biradicals  $-\text{CH}_2\text{CH}_2-$  of said alkylene biradical may be independently replaced by ethenylene and ethynylene moieties; and  
wherein  $n = 1$  or more, one or more methylene biradicals  $-\text{CH}_2-$  may be replaced independently with an optionally substituted mono- or polycyclic hydrocarbon biradical comprising from 4 to 50 carbon atoms, or a corresponding heteromonocyclic or heteropolycyclic biradical  
wherein at least 1  $\text{CH}_2$  or  $\text{CH}_2-$  is substituted by an oxygen sulfur or nitrogen atom or an NH group; and

C\* is a group for reaction with a compound to bind said compound covalently to said hydrogel)  
to form a polymerised product wherein said polymerising is conducted on, and immobilises the polymerised product to, said solid support.

44. (canceled)

45. (currently amended) The method of claim 43 37 wherein the polyelectrolyte applied is polyacrylic acid.

46. (currently amended) The method of claim 43 37 wherein polyallylamine is applied to the array followed by polyacrylic acid.

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47. (currently amended) The method of claim 43 37 wherein the neutral polymer is polyethylene glycol.
48. (currently amended) The method of claim 43 37 wherein the method comprises modifying a microarray or a single molecule array.
49. (original) The method of claim 48 wherein the method comprises modifying a single molecule array.
50. (original) The method of claim 48 wherein the method comprises modifying a clustered microarray.

51–53. (canceled)

54–60. (canceled)